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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,721	10/09/2001	Jian Zhou	M-11928 US	7841

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Silicon Valley Patent Group LLP
18805 Cox Avenue
Suite 220
Saratoga, CA 95070

EXAMINER	
LAROSE, COLIN M	
ART UNIT	PAPER NUMBER
2624	

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11/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/974,721	ZHOU ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,22 and 24-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9-16,22 and 25* is/are allowed.

6)☒ Claim(s) *1-3,8 and 24* is/are rejected.

7)☒ Claim(s) *4-7 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 October 2007 has been entered.

Response to Amendments and Remarks

2. Applicant's arguments with respect to newly-amended claim 1 are persuasive. Accordingly, the previous § 102 and § 103 rejections with respect to Scheiner (U.S. 6,556,947) have been withdrawn. New grounds of rejection appear below based on newly-discovered prior art.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,109,430 by Nishihara et al. ("Nishihara").

Regarding claim 1, Nishihara discloses a method for forming a recipe for de-skewing wafers, comprising:

learning a first pattern at a de-skew site on a first wafer layer (column 10/50-62: a model of alignment pattern A (figure 1) corresponding to e.g., pattern 12 on a first layer of a de-skew site in figure 2, is "learned" in the sense that knowledge of the pattern is acquired in some manner);

saving the first pattern and its location in a recipe for de-skewing multiple wafer layers (column 10/50-62: the learned model of pattern A is stored in a "recipe"—i.e., a collection of related data—in memory (element 30, figure 12) and is used for aligning multiple layer of a wafer; the location of the stored pattern in memory must also be saved so that the pattern can be retrieved for later use);

learning a second pattern at the de-skew site on a second wafer layer (column 10/50-62: a model of alignment pattern B (figure 5) corresponding to a pattern on a second layer of the de-skew is "learned" in the sense that knowledge of the pattern is acquired in some manner; this second pattern may be identical to or different from pattern A; see also figure 2, which shows the second pattern in a second layer at the de-skew site); and

saving the second pattern in the same recipe (column 10/50-62: the learned model of pattern A/B is stored in a "recipe"—i.e., a collection of related data—in memory (element 30, figure 12)).

Regarding claim 24, Nishihara teaches that the first wafer layer is a top surface of said wafer and said second wafer layer is the top surface of said wafer after said wafer is processed (see figure 2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,109,430 by Nishihara et al. ("Nishihara").

Regarding claim 8, Nishihara does not expressly disclose that saving the first pattern in the recipe comprises saving a file name of a file including the first pattern. However, at the time the invention was made, digital data (including digital image data) to be stored in a computer's memory was conventionally stored in a collection of related data known as a "file," which is labeled with a "file name." This was an exceedingly common practice at the time the invention was made, and it would have been obvious to those skilled in the art to store Nishihara's model pattern data in a file having a file name, as claimed. Official notice taken.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,109,430 by Nishihara et al. ("Nishihara") in view of U.S. Patent 6,240,208 by Garakani et al. ("Garakani").

Regarding claim 2, Nishihara does not disclose learning the first pattern comprises determining a score of uniqueness for the first pattern.

Garakani discloses a method for identifying reference patterns to be utilized for aligning wafers. In particular, Garakani discloses that it is advantageous to select reference patterns that are unique. Garakani teaches determining the uniqueness of potential reference patterns, and selecting from among the reference patterns on the basis of their uniqueness scores. For example, in figure 2, the uniqueness of various reference patterns is measured at step 240, and the suggested reference patterns are ordered at step 260 based in part on the uniqueness scores.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nishihara by Garakani to determine a score of uniqueness for the first pattern to be learned, since Garakani discloses that it is advantageous to select a reference pattern utilized for aligning semiconductor wafer layers that is unique, and determining a score of uniqueness indicates whether a pattern to be learned is unique (see e.g. column 1, lines 19-32; column 6, lines 58-67).

Regarding claim 3, Garakani discloses selecting a first pattern that has a parameter value (e.g. uniqueness) greater than a threshold (see column 7, lines 51-59). Therefore, a pattern that is learned and saved according to Nishihara's teachings is sufficiently unique.

Allowable Subject Matter

8. Claims 9-16, 22, and 25, as previously indicated, are allowable. Claims 9-16 are allowable for the reasons previously given. Claims 22 and 25 are allowable for the reasons previously given and for the following additional reasons:

Regarding claim 22, Nishihara discloses a methods comprising:

forming a recipe for de-skewing wafers comprising:

learning a first pattern at a de-skew site on a first wafer layer (column 10/50-62: a model of alignment pattern A (figure 1) corresponding to e.g., pattern 12 on a first layer of a de-skew site in figure 2, is "learned" in the sense that knowledge of the pattern is acquired in some manner);

saving the learned first pattern in the recipe for a plurality of wafer layers (column 10/50-62: the learned model of pattern A is stored in a "recipe"—i.e., a collection of related data—in memory (element 30, figure 12) and is used for de-skewing multiple wafer layers when pattern A is etched onto various wafer layers); and

determining that the learned first pattern matches a second pattern at the de-skew site on a second wafer layer (figure 2: pattern A (12) to be etched in a first layer of the wafer matches a pattern (24) to be etched in a second wafer layer at a de-skew site—such information is known or otherwise determined in advance of the etching).

However, Nishihara does not appear to disclose the method further comprises:

using said first pattern to de-skew a wafer by comparing the learned first pattern to the first pattern at the de-skew site on the first wafer layer of the wafer and

using said first pattern to de-skew the wafer at a later time by comparing the first pattern to the second pattern at the de-skew site on the second wafer layer of the wafer.

Rather, Nishihara appears to compare the learned first pattern (i.e., the stored pattern 30) with a combination of the first and second patterns etched at the de-skew site on the first and second layers, respectively—this composite image is represented in figure 12 as SEM image 31. See, e.g., columns 10/58-62 and 11/5-10. Accordingly, Nishihara does not appear to compare the learned first pattern to the first pattern at the de-skew site on a first layer and then, at a later time,

compare the learned first pattern to the second pattern at the de-skew site on a second layer, as claimed.

9. Claims 4-7 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Related Prior Art

10. Additional prior art document(s) considered by the Examiner but not relied upon are listed on the attached "Notice of References Cited."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner, can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Colin M. LaRose
Group Art Unit 2624
16 November 2007